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T-2377

Job No.: CTCE/BBMP/LLR/W.No.04/CSR-05/047c/CEMENT/2016-17 Date: 26.05.2016

TEST REPORT ON CEMENT

* CUSTOMER	:	**Asst. Executive Engineer, Yelahanka** Sub Division, BBMP, Bangalore.
*AGENCY	:	**Mr. L Lokanatha Reddy,** No. 5, 1st H Main Road, 7th B Cross road Kaveri nagara B Block , Kaval Byrasandra, Bangalore.
*NAME OF THE WORK	:	Improvements to drains and asphalting to main and cross roads in B sector in Ward No. 04, BBMP, Bangalore.
*REFERENCE	:	BBMP/AEE/YNSD/73/2016-17 Dated : 24.05.2016
SAMPLE ID	:	Cement
SAMPLE RECEIVED ON	:	24.05.2016
PERIOD OF TESTING	:	24.05.2016 to 26.05.2016

The results of the tests conducted on the cement sample are as follows:

Sl. No	Descriptions	Test Method as per IS	Test Result	Requirements as per IS: 8112-2013
1	Standard Consistency	IS-4031 (Part -4) 1988(RA-2009)	28.00 %	-
2	a) Initial Setting Time	IS-4031 (Part -5) 1988(RA-2009)	160Minutes	Not Less than 30 Minutes
	b) Final Setting Time	IS-4031 (Part -5) 1988(RA-2009)	465 Minutes	Not More than 600 Minutes
3	Soundness by Le Chartlier Method	IS-4031 (Part-3) 1988(RA-2009)	1 mm	Not more than 10mm

*Information is furnished by the Customer/Representative.

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⇒ Any Query regarding the report must be reported within 30 days from the date of testing.

Ram Sanjeev AE 26/5

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Job No.: CTCE/BBMP/LLR/W.No.04/WMM/AIV/2016-17

20.06.2016

Aggregate Impact Value

IS: 2386 Part IV

Customer	**Asst. Executive Engineer,** Yelahanka Sub Division, BBMP, Bangalore.
Agency	**Mr. L Lokanatha Reddy,** No. 5, 1st H Main Road, 7th B Cross road Kaveri nagara B Block , Kaval Byrasandra, Bangalore.
Name of the Work	Improvements to drains and asphalting to main and cross roads in B sector in Ward No. 04, BBMP, Bangalore.
Reference	BBMP/AEE/YNSD/73/2016-17 Dated : 24.05.2016
Source / Location	WMM Plant
Type of Mix	Wet Mix macadam
Date of Testing	20.06.2016

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	382	385	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	80	81	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	302	304	
4	Aggregate Impact value = percent fines	20.94	21.04	
	100* (W_2/W_1)%			20.99

Comments:

→ Maximum allowable Aggregate Impact value for Wet mix Macadam is 30%

Note:

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Job No.: CTCE/BBMP/LLR/W No.04/WMM/S-T/2015-16 20.06.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	**Asst. Executive Engineer,** Yelahanka Sub Division, BBMP, Bangalore.
Agency	**Mr. L Lokanatha Reddy,** No. 5, 1st H Main Road, 7th B Cross road Kaveri nagara B Block , Kaval Byrasandra, Bangalore.
Name of Work	Improvements to drains and asphalting to main and cross roads in B sector in Ward No. 04, BBMP, Bangalore.
Reference	BBMP/AEE/YNSD/73/2016-17 Dated : 24.05.2016
Technical Reference	IS 2386(Part 1) 1963 (RA 2011)
Type of Mix	Wet Mix Macadam
Date of Testing	20.06.2016

Result : Flakiness Index = **11.32%**

Elongation Index = **13.32%**

Result : Combined Flakiness & Elongation index **24.64%**

Comments:

Maximum allowable Flakiness & Elongation Index for Wet Mix Macadam is 30%

Note:

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T-2377

Job No.: CTCE/BBMP/LLR/W.No.04/CSR-05/047c/QB(SDBC)/2016-17 24.06.2016

TEST REPORT ON DETERMINATION OF BITUMEN CHARACTERISTICS

*CUSTOMER	:	**Asst. Executive Engineer,** Yelahanka Sub Division, BBMP, Bangalore.
*AGENCY	:	**Mr. L Lokanatha Reddy,** No. 5, 1st H Main Road, 7th B Cross road Kaveri nagara B Block , Kaval Byrasandra, Bangalore.
*NAME OF THE WORK	:	Improvements to drains and asphalting to main and cross roads in B sector in Ward No. 04, BBMP, Bangalore.
REFERENCE	:	BBMP/AEE/YNSD/73/2016-17 Dated : 24.05.2016
*SAMPLE ID	:	Bitumen
DATE OF SAMPLING	:	22.06.2016
DATE OF TESTING	:	24.06.2016

The results of the tests conducted on the bitumen sample.

Sl. No	Description	Test Method as per IS	Test Result	Requirement as per IS:73:2013
1	Penetration at 25 °C, 1/10 mm	IS :1203 -1978 (RA-2009)	66	60 to 70
2	Softening point, °C	IS :1205 -1978 (RA-2009)	46	Min. 45
3	Ductility at 27°C, cm	IS :1208 -1978 (RA-2009)	100 >	Min. 50
4	Flash Point, °C	IS :1209 -1978 (RA-2009)	302	Min. 220

*Information is furnished by the Customer/Representative.

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24.06.2016

Aggregate Impact Value

IS: 2386 Part IV

Customer	Asst. Executive Engineer, Yelahanka Sub Division, BBMP, Bangalore.
Agency	Mr. L Lokanatha Reddy, No. 5, 1st H Main Road, 7th B Cross road Kaveri nagara B Block , Kaval Byrasandra, Bangalore.
Name of the Work	Improvements to drains and asphalting to main and cross roads in B sector in Ward No. 04, BBMP, Bangalore.
Reference	BBMP/AEE/YNSD/73/2016-17 Dated : 24.05.2016
Source / Location	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	24.06.2016

Sl No.	Details	Trial No. 1	Trial No. 2	Average
1	Total weight of aggregate sample filling the cylindrical measure = W_1 g	389	392	
2	Weight of agregate passing 2.36 mm sieve after the test = W_2 g	87	89	
3	Weight of aggregate retained 2.36 mm sieve after the test = W_3 g	305	308	
4	Aggregate Impact value = percent fines 100* (W_2/W_1)%	22.37	22.70	22.53

Comments:

→ Maximum allowable Aggregate Impact value for Semi Dense Bituminous Concrete is 27%

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Job No.: CTCE/BBMP/LLR/W.No.04/SDBC/Shape_T/2016-17 : 24.06.2016

DETERMINATION OF FLAKINESS INDEX & ELONGATION INDEX OF COARSE AGGREGATES

Customer	: **Asst. Executive Engineer,** Yelahanka Sub Division, BBMP, Bangalore.
Agency	: **Mr. L Lokanatha Reddy,** No. 5, 1st H Main Road, 7th B Cross road Kaveri nagara B Block , Kaval Byrasandra, Bangalore.
Name of Work	: Improvements to drains and asphalting to main and cross roads in B sector in Ward No. 04, BBMP, Bangalore.
Reference	: BBMP/AEE/YNSD/73/2016-17 Dated : 24.05.2016
Technical Reference	: IS 2386(Part 1) 1963 (RA 2007)
Type of Mix	: Semi Dense Bituminous Concrete
Date of Testing	: 24.06.2016

Result : Flakiness Index = **11.96%**

Elongation Index = **13.90%**

Result : Combined Flakiness & Elongation index **25.86%**

Comments:

Maximum allowable Flakiness & Elongation Index for Semi Dense Bitumunous Concrete is 30%

Note:

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Job No.: CTCE/BBMP/LLR/W.No.04/SDBC/Stripping/2016-17 25.06.2016

Stripping Value of Road Aggregates (Static Immersion Test)

IS: 6241

Customer	**Asst. Executive Engineer,** Yelahanka Sub Division, BBMP, Bangalore.
Agency	**Mr. L Lokanatha Reddy,** No. 5, 1st H Main Road, 7th B Cross road Kaveri nagara B Block , Kaval Byrasandra, Bangalore.
Name of the work	Improvements to drains and asphalting to main and cross roads in B sector in Ward No. 04, BBMP, Bangalore.
Reference	BBMP/AEE/YNSD/73/2016-17 Dated : 24.05.2016
Type of Mix	Semi Dense Bituminous Concrete
Date of Testing	25.06.2016

Type of binder : 60/70
Percentage of binder used : 5.0% by wt.
Total weight of aggregate : 200 g
Total weight of binder : 10.0 g
Temperature of water-bath : 40° C

Observation Number	Stripping, Percentage	Average, Percentage	Average Retained Coating, %
1	3.1	3.20	96.80
2	3.2		
3	3.3		

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Comments:

→ Minimum allowable Aggregate retained coating for Semi Dense Bituminous Concrete is 95%

Note:

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Job No.: CTCE/BBMP/LLR/W.No.04/SDBC/Sp_Wa/2016-17

25.06.2016

Specific Gravity And Water Absorption Test

IS: 2386 Part III

Customer	**Asst. Executive Engineer,** Yelahanka Sub Division, BBMP, Bangalore.
Agency	**Mr. L Lokanatha Reddy,** No. 5, 1st H Main Road, 7th B Cross road Kaveri nagara B Block , Kaval Byrasandra, Bangalore.
Name of the Work	Improvements to drains and asphalting to main and cross roads in B sector in Ward No. 04, BBMP, Bangalore.
Reference	BBMP/AEE/YNSD/73/2016-17 Dated : 24.05.2016
Type of Mix	Semi Dense Bituminous Concrete
Source / Location	Hotmix Plant, Bangalore
Date of Testing	25.06.2016

Sl. No.	Details	Notation	Test Number			Mean Value
			Test 1	Test 2	Test 3	
1	Weight of aggregate suspended in water with the basket	W_1 g	2009	2012	2014	
2	Weight of basket suspended in water	W_2 g	755	755	755	
3	Weight of saturated aggregate in water	$(W_1 - W_2) = W_3$ g	1254	1257	1259	
4	Weight of saturated surface dry aggregate in air	W_3 g	2012	2016	2020	
5	Weight of water equal to the volume of the aggregate	$(W_3 - W_4)$ g	758	759	761	
6	Weight of oven dried aggregate	W_4 g	1998	2000	2006	
7	Specific Gravity	$W_4/(W_3-W_4)$	2.636	2.635	2.636	2.636
8	Apparent Specific gravity	$W_4/(W_4-W_4)$	2.685	2.692	2.685	2.688
9	Water Absorption	$((W_3-W_4)*100)/W_4$	0.70%	0.80%	0.70%	0.73%

Comments:

→ Maximum allowable Aggregate Water absorption value for Semi Dense Bituminous Concrete is 2.0%

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Job No.: CTCE/BBMP/LLR/W.No.04/SDBC/AGG/2016-17 25.06.2016

Aggregate Gradation Test

IS : 2386 Part I

Customer	**Asst. Executive Engineer,** Yelahanka Sub Division, BBMP, Bangalore.
Agency	**Mr. L Lokanatha Reddy,** No. 5, 1st H Main Road, 7th B Cross road Kaveri nagara B Block , Kaval Byrasandra, Bangalore.
Name of the Work	Improvements to drains and asphalting to main and cross roads in B sector in Ward No. 04, BBMP, Bangalore.
Reference	BBMP/AEE/YNSD/73/2016-17 Dated : 24.05.2016
Sample I / D	Hot Mix Plant, Bangalore
Type of Mix	Semi Dense Bituminous Concrete (SDBC)
Date of Testing	25.06.2016

Total Weight of Sample: **5350** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	285	5.3	5.33	94.67	90-100	
4.75	2490	46.5	51.87	48.13	35-51	
2.36	655	12.2	64.11	35.89	24-39	
1.18	630	11.8	75.89	24.11	15-30	
0.3	480	9.0	84.86	15.14	9-19	
0.075	530	9.9	94.77	5.23	3-8	

Total Weight of Sample: **5400** gm

SIEVE SIZE, mm	Weight Retained, gm	% Retained	Cummulative % Retained	% Passing	Grade-II As per MORTH	Remarks
13.2	0	0.0	0	100	100	Gradation satisfies Grade-II MORTH specification
9.5	310	5.7	5.74	94.26	90-100	
4.75	2550	47.2	52.96	47.04	35-51	
2.36	630	11.7	64.63	35.37	24-39	
1.18	490	9.1	73.70	26.30	15-30	
0.3	480	8.9	82.59	17.41	9-19	
0.075	635	11.8	94.35	5.65	3-8	

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Job No.: CTCE/BBMP/LLR/W.No.04/SDBC/Stability/2016-17 25.06.2016

TEST REPORT ON STABILITY OF MIX

Customer	:	**Asst. Executive Engineer, Yelahanka** Sub Division, BBMP, Bangalore.
Agency	:	**Mr. L Lokanatha Reddy,** No. 5, 1st H Main Road, 7th B Cross road Kaveri nagara B Block , Kaval Byrasandra, Bangalore.
Name of the Work	:	Improvements to drains and asphalting to main and cross roads in B sector in Ward No. 04, BBMP, Bangalore.
Reference	:	BBMP/AEE/YNSD/73/2016-17 Dated : 24.05.2016
Source of location	:	Hot mix Plant, Bangalore
Type of Mix	:	Semi Dense Bituminous Concrete
Date of Testing	:	25.06.2016

The results of the tests conducted on the bituminous concrete mix sample are as follows:

Sl. No	Description	Test Result 1	Test Result 2	Requirement as per MORTH (Table 500-16)
1	Marshal Stability, Kn	8.75	8.25	8.2 Kn (min)
2	Marshal flow, mm	3.40	3.45	2 – 4
3	Percent air voids in Mineral Aggregate	3.90	3.85	3 – 5
4	Voids in Compacted Mix	13.80	14.15	13 – 15
5	Percent Voids filled with Bitumen	65.30	66.35	65 - 78
6	Density, g/cc	2.25	2.26	--

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Job No.: CTCE/BBMP/LLR/W.No. 04/CSR-05/047c/CUBE/2016-17 12.07.2016

TEST REPORT ON COMPRESSIVE STRENGTH OF CONCRETE CUBES

* Customer	: **Asst. Executive Engineer,** Yelahanka Sub Division, BBMP, Bangalore.
* Agency	: **Mr. L Lokanatha Reddy,** No. 5, 1st H Main Road, 7th B Cross road Kaveri nagara B Block , Kaval Byrasandra, Bangalore.
* Name of the work	: Improvements to drains and asphalting to main and cross roads in B sector in Ward No. 04, BBMP, Bangalore.
* Reference	: BBMP/AEE/YNSD/73/2016-17 Dated : 24.05.2016
* Sample ID	: Cement Concrete
Size of cubes	: 150mmx150mmx150mm
Cross Sectional Area	: 22500 mm^2
Technical Reference	: IS: 516-1959 (Reaffirmed 2008)
* Grade of Concrete	: M_{15}
Compressive Strength as on	: 28^{th} day
Sample Received on	: 12.07.2016

Sl.No.	Date of casting	Date of testing	Weight of cube (Kg)	Failure load (KN)	Compressive strength (N/mm^2)
1	14.06.2016	12.07.2016	8.130	365.9	16.26
2	14.06.2016	12.07.2016	8.239	390.3	17.35
3	14.06.2016	12.07.2016	8.382	399.8	17.77

* Information is furnished by the Customer/Representative

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Job No.: CTCE/BBMP/LLR/W.No.04/STEEL/2016-17 30.05.2016

TEST REPORT ON REINFORCEMENT STEEL

Customer : **Asst. Executive Engineer, Yelahanka** Sub Division, BBMP, Bangalore.

Agency : **Mr. L Lokanatha Reddy,** No. 5, 1st H Main Road, 7th B Cross road Kaveri nagara B Block , Kaval Byrasandra, Bangalore.

Name of the Work : Improvements to drains and asphalting to main and cross roads in B sector in Ward No. 04, BBMP, Bangalore.

Reference : BBMP/AEE/YNSD/73/2016-17 Dated : 24.05.2016

Date of Test : 30.05.2016

Technical Reference : IS: 1786-2008

Sl. No	Nominal size (dia) (mm)	Mass per metre (Kg/mtr)	TENSILE STRENGTH			Bend Test	Rebend Test
			0.20% proof stress/Yield stress N/mm²	Tensile strength (Ultimate stress) N/mm²	Elongation percent gauge length		
1	8	0.40	510	552	13.00	O.K	O.K

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Job No. CTCE/BBMP/LLR/W.No.04/STEEL/2016-17 30.05.2016

TEST REPORT ON REINFORCEMENT STEEL

Customer : **Asst. Executive Engineer, Yelahanka** Sub Division, BBMP, Bangalore.

Agency : **Mr. L Lokanatha Reddy,** No. 5, 1st H Main Road, 7th B Cross road Kaveri nagara B Block , Kaval Byrasandra, Bangalore.

Name of the Work : Improvements to drains and asphalting to main and cross roads in B sector in Ward No. 04, BBMP, Bangalore.

Reference : BBMP/AEE/YNSD/73/2016-17 Dated : 24.05.2016

Date of Test : 30.05.2016

Technical Reference : IS: 1786-2008

Sl. No	Nominal size (dia) (mm)	Mass per metre (Kg/mtr)	TENSILE STRENGTH			Bend Test	Rebend Test
			0.20% proof stress/Yield stress N/mm²	Tensile strength (Ultimate stress) N/mm²	Elongation percent gauge length		
1	10	0.62	512	557	13.35	O.K	O.K

Note:

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⇒ Any Query regarding the report must be reported within 30 days from the date of testing.

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Civil-tech Consultants & Engineers
#23/14, 7th Cross, 3rd Stage, 4th Block,
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CIVIL-TECH CONSULTANTS AND ENGINEERS

Building & Highway Material Testing Laboratory

An ISO 9001:2008 Certified Company

NABL - Accredited Laboratory as per ISO / IEC-17025 : 2005

Job No.: CTCE/BBMP/LLR/W.No.04/STEEL/2016-17 30.05.2016

TEST REPORT ON REINFORCEMENT STEEL

Customer : **Asst. Executive Engineer, Yelahanka** Sub Division, BBMP, Bangalore.

Agency : **Mr. L Lokanatha Reddy,** No. 5, 1st H Main Road, 7th B Cross road Kaveri nagara B Block , Kaval Byrasandra, Bangalore.

Name of the Work : Improvements to drains and asphalting to main and cross roads in B sector in Ward No. 04, BBMP, Bangalore.

Reference : BBMP/AEE/YNSD/73/2016-17 Dated : 24.05.2016

Date of Test : 30.05.2016

Technical Reference : IS: 1786-2008

Sl. No	Nominal size (dia) (mm)	Mass per metre (Kg/mtr)	TENSILE STRENGTH			Bend Test	Rebend Test
			0.20% proof stress/Yield stress N/mm²	Tensile strength (Ultimate stress) N/mm²	Elongation percent gauge length		
1	12	0.89	516	557	13.50	O.K	O.K

Note:

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